Citation:

Tate DF, Wing RR, Winett RA. Using Internet technology to deliver a behavioral weight-loss program. *JAMA*. 2001 Mar 7; 285 (9): 1,172-1,177.

PubMed ID: 11231746

Study Design:

Randomized Controlled Trial

Class:

A - Click here for explanation of classification scheme.

Research Design and Implementation Rating:

POSITIVE: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To determine whether a structured, Internet behavioral weight-loss program produces greater initial weight-loss and changes in waist circumference than a weight-loss education website.

Inclusion Criteria:

- Ages 18-60 years
- BMI of 25 to 36kg/m^2.

Exclusion Criteria:

- History of myocardial infarction, stroke or cancer in the last five years
- Diabetes, angina, or orthopedic or joint problems that would prohibit exercise
- Major psychiatric diseases
- Current, planned or previous pregnancy within six months.

Description of Study Protocol:

Recruitment

- Subjects, all employed by a large network of hospitals with access to email and the Internet, were recruited through a series of two email messages and an advertisement posted to the work site's Intranet website. The email messages and advertisement clearly states the eligibility criteria
- Interested participants were further screened for eligibility via telephone.

Design

Six-month randomized controlled trial.

Dietary Intake/Dietary Assessment Methodology

Block Food-Frequency Questionnaire (FFQ).

Blinding Used

None reported.

Intervention

- Participants were randomly assigned to a six-month weight-loss program of either Internet education or Internet behavior therapy
- All participants were given one face-to-face group weight-loss session and access to a website with organized links to Internet weight-loss resources
- Participants in the behavior therapy group received additional behavioral procedures, including a sequence of 24 weekly behavioral lessons via email, weekly only submission of self-monitoring diaries with individualized therapist feedback via email and an online bulletin board.

Statistical Analysis

- Using an α level of 0.05 and power of 80%, a sample size of 37 subjects per group was needed to detect a 2.7 kg difference in weight between groups. Assuming an attrition rate of 20%, a sample of at least 90 subjects were selected
- To detect changes in the outcomes of weight, waist circumference, calorie intake and expenditure, repeated-measures ANOVA models were used.

Data Collection Summary:

Timing of Measurements

Measurements were taken at baseline, three months and six months.

Dependent Variables

- Body weight was measured in the clinic at baseline, three months and six months
- Physical activity was measured at each assessment using a self-report format of the Paffenbarger activity questionnaire
- Dietary intake was measured using the Block FFQ.

Independent Variables

Intervention group was the primary independent variable.

Control Variables

Not applicable.

Description of Actual Data Sample:

- *Initial N*: 91
- *Attrition (final N):* 65 (Attrition rate was 15% and 22% at three and six months, respectively)
- *Mean age:* 41 years
- *Ethnicity:* 78% of the Internet education group and 89% of the Internet behavior therapy

group were white
- *Other relevant demographics*: Not applicable
- *Anthropometrics:* Baseline BMI was 29kg/m^2
- *Location:* United States.

Summary of Results:

- Those in the behavior therapy group lost more weight than those in the education group from baseline to three months. Both groups maintained their weight-loss between three and six months, but did not lose additional weight
- Among these [participants who completed all three assessment, the behavior therapy group lost 4.0±2.8kg by three months and 4.1±4.5kg by six months. Weight-loss in the education group lost 1.7±2.7kg by three months and 1.6±3.3kg by six months. The groups differed significantly at both three months (P=0.001) and six months (P=0.04)
- Waist circumference reductions were also significantly different between the groups at both three months (P=0.001) and six months (P=0.009)
- Website login frequency was significantly correlated with weight change between zero and six months both in the behavior therapy (r=-0.43, P=0.003) and in the education group (r=-0.33, P=0.03)
- Dietary change and physical activity change occurred in both groups, but there were no differences between groups
- Participants submitted a mean 13.65 self-monitoring diaries during the 24-week program. Total number of diaries submitted was significantly correlated with weight-loss (r=-0.50, P=0.001).

Author Conclusion:

- Subjects who were given a structured behavioral treatment program with weekly contact and individualized feedback had better weight-loss compared with those given links to educational websites
- The Internet and email appear to be viable methods for delivery of structured behavioral weight-loss programs.

Reviewer Comments:

The limitations of this study, as noted by the authors, include:

- *The efficacy of a program such as this for producing long-term weight-losses and maintenance remains to be demonstrated*
- *The study design used does not allow for dismantling of the behavior therapy program to determine the critical components of the intervention.*

Research Design and Implementation Criteria Checklist: Primary Research

Relevance Questions

1.	Would implementing the studied intervention or procedure (if found successful) result in improved outcomes for the patients/clients/population group? (Not Applicable for some epidemiological studies)	Yes
2.	Did the authors study an outcome (dependent variable) or topic that the patients/clients/population group would care about?	Yes
3.	Is the focus of the intervention or procedure (independent variable) or topic of study a common issue of concern to nutrition or dietetics practice?	Yes
4.	Is the intervention or procedure feasible? (NA for some epidemiological studies)	Yes

Validity Questions

1.	**Was the research question clearly stated?**	Yes
1.1.	Was (were) the specific intervention(s) or procedure(s) [independent variable(s)] identified?	Yes
1.2.	Was (were) the outcome(s) [dependent variable(s)] clearly indicated?	Yes
1.3.	Were the target population and setting specified?	No
2.	**Was the selection of study subjects/patients free from bias?**	Yes
2.1.	Were inclusion/exclusion criteria specified (e.g., risk, point in disease progression, diagnostic or prognosis criteria), and with sufficient detail and without omitting criteria critical to the study?	Yes
2.2.	Were criteria applied equally to all study groups?	Yes
2.3.	Were health, demographics, and other characteristics of subjects described?	Yes
2.4.	Were the subjects/patients a representative sample of the relevant population?	???
3.	**Were study groups comparable?**	Yes
3.1.	Was the method of assigning subjects/patients to groups described and unbiased? (Method of randomization identified if RCT)	Yes
3.2.	Were distribution of disease status, prognostic factors, and other factors (e.g., demographics) similar across study groups at baseline?	Yes
3.3.	Were concurrent controls used? (Concurrent preferred over historical controls.)	Yes
3.4.	If cohort study or cross-sectional study, were groups comparable on important confounding factors and/or were preexisting differences accounted for by using appropriate adjustments in statistical analysis?	N/A

3.5.	If case control or cross-sectional study, were potential confounding factors comparable for cases and controls? (If case series or trial with subjects serving as own control, this criterion is not applicable. Criterion may not be applicable in some cross-sectional studies.)	N/A
3.6.	If diagnostic test, was there an independent blind comparison with an appropriate reference standard (e.g., "gold standard")?	N/A
4.	**Was method of handling withdrawals described?**	Yes
4.1.	Were follow-up methods described and the same for all groups?	Yes
4.2.	Was the number, characteristics of withdrawals (i.e., dropouts, lost to follow up, attrition rate) and/or response rate (cross-sectional studies) described for each group? (Follow up goal for a strong study is 80%.)	Yes
4.3.	Were all enrolled subjects/patients (in the original sample) accounted for?	Yes
4.4.	Were reasons for withdrawals similar across groups?	No
4.5.	If diagnostic test, was decision to perform reference test not dependent on results of test under study?	N/A
5.	**Was blinding used to prevent introduction of bias?**	Yes
5.1.	In intervention study, were subjects, clinicians/practitioners, and investigators blinded to treatment group, as appropriate?	Yes
5.2.	Were data collectors blinded for outcomes assessment? (If outcome is measured using an objective test, such as a lab value, this criterion is assumed to be met.)	Yes
5.3.	In cohort study or cross-sectional study, were measurements of outcomes and risk factors blinded?	N/A
5.4.	In case control study, was case definition explicit and case ascertainment not influenced by exposure status?	N/A
5.5.	In diagnostic study, were test results blinded to patient history and other test results?	N/A
6.	**Were intervention/therapeutic regimens/exposure factor or procedure and any comparison(s) described in detail? Were interveningfactors described?**	Yes
6.1.	In RCT or other intervention trial, were protocols described for all regimens studied?	Yes
6.2.	In observational study, were interventions, study settings, and clinicians/provider described?	N/A
6.3.	Was the intensity and duration of the intervention or exposure factor sufficient to produce a meaningful effect?	Yes
6.4.	Was the amount of exposure and, if relevant, subject/patient compliance measured?	Yes

6.5.	Were co-interventions (e.g., ancillary treatments, other therapies) described?	No
6.6.	Were extra or unplanned treatments described?	No
6.7.	Was the information for 6.4, 6.5, and 6.6 assessed the same way for all groups?	No
6.8.	In diagnostic study, were details of test administration and replication sufficient?	N/A
7.	**Were outcomes clearly defined and the measurements valid and reliable?**	Yes
7.1.	Were primary and secondary endpoints described and relevant to the question?	Yes
7.2.	Were nutrition measures appropriate to question and outcomes of concern?	Yes
7.3.	Was the period of follow-up long enough for important outcome(s) to occur?	Yes
7.4.	Were the observations and measurements based on standard, valid, and reliable data collection instruments/tests/procedures?	Yes
7.5.	Was the measurement of effect at an appropriate level of precision?	Yes
7.6.	Were other factors accounted for (measured) that could affect outcomes?	No
7.7.	Were the measurements conducted consistently across groups?	Yes
8.	**Was the statistical analysis appropriate for the study design and type of outcome indicators?**	Yes
8.1.	Were statistical analyses adequately described and the results reported appropriately?	Yes
8.2.	Were correct statistical tests used and assumptions of test not violated?	Yes
8.3.	Were statistics reported with levels of significance and/or confidence intervals?	Yes
8.4.	Was "intent to treat" analysis of outcomes done (and as appropriate, was there an analysis of outcomes for those maximally exposed or a dose-response analysis)?	Yes
8.5.	Were adequate adjustments made for effects of confounding factors that might have affected the outcomes (e.g., multivariate analyses)?	No
8.6.	Was clinical significance as well as statistical significance reported?	Yes
8.7.	If negative findings, was a power calculation reported to address type 2 error?	Yes
9.	**Are conclusions supported by results with biases and limitations taken into consideration?**	Yes
9.1.	Is there a discussion of findings?	Yes

9.2.	Are biases and study limitations identified and discussed?	Yes
10.	**Is bias due to study's funding or sponsorship unlikely?**	Yes
10.1.	Were sources of funding and investigators' affiliations described?	Yes
10.2.	Was the study free from apparent conflict of interest?	Yes